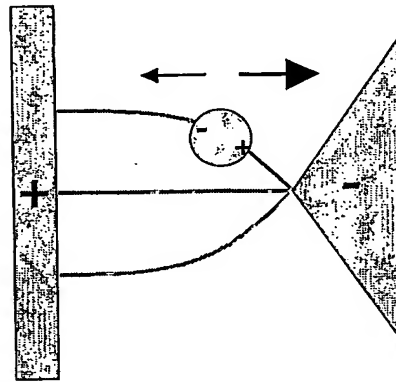


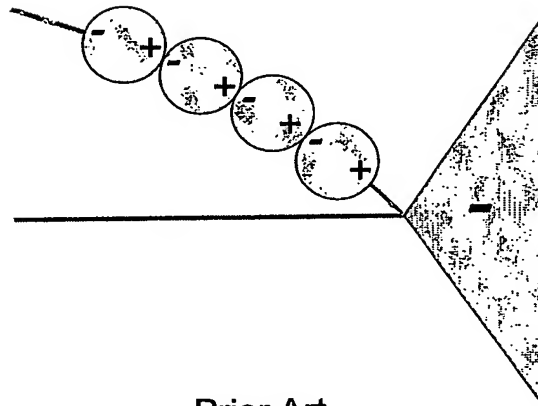
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Non Uniform Field Movement



Prior Art

FIG. 1



Prior Art

FIG. 2

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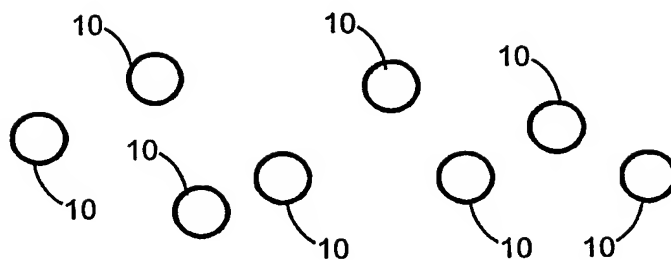


FIG. 3

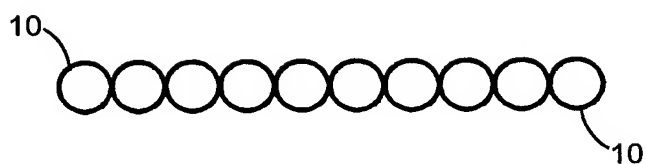


FIG. 4

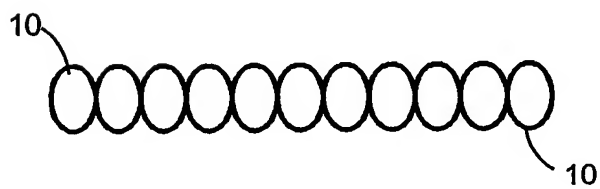
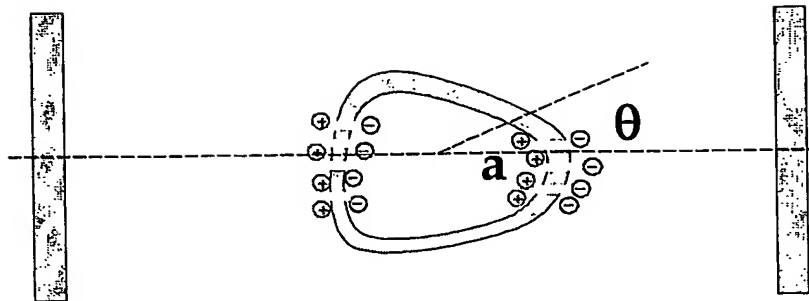


FIG. 5

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Transmembrane voltage due to Electric field

$$V_m = -1.5a |\cos(\theta)| E$$

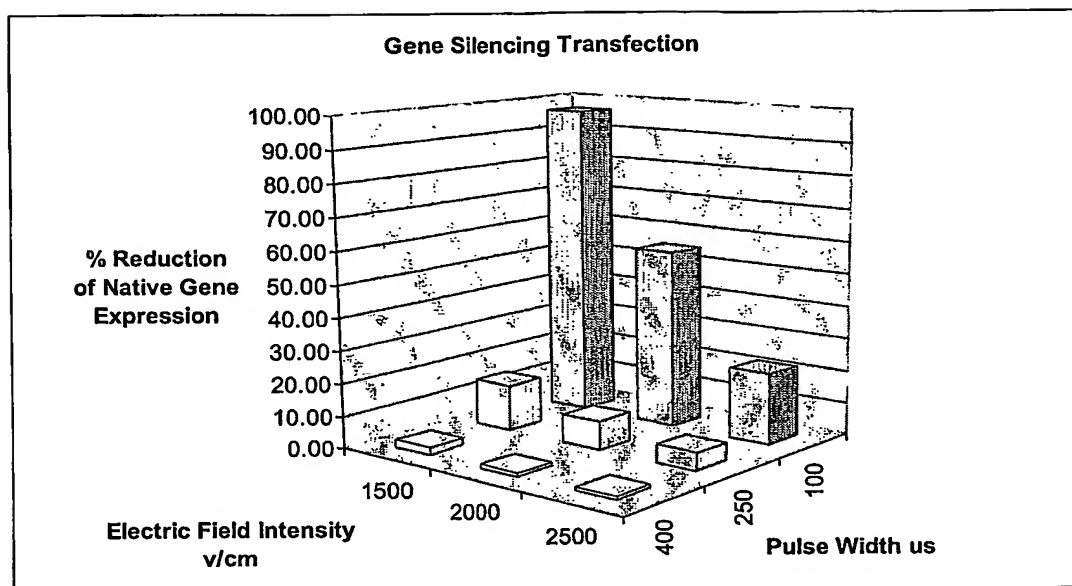
For coaxial Electrode

$$E = -\frac{V}{r_1 \ln(r_1/r_2)}$$

Prior ART

FIG. 6

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PA-4000 Cyto Pulse Sciences Electroporation System
Cytofusion, 80 μ S/cm medium
2 mm cuvette
GAPDH siRNA
PC12 cells

FIG. 7

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Force applied on a neutral particle by a nonlinear electric field

$$F_{dep} = a^3 [2\pi \varepsilon_{medium} K(\varepsilon, \sigma, \omega, r)] \nabla E^2$$

a = cell radius

ε = permittivity of medium external to the cell

K = Clausius-Mossotti Function, page 46, Jones

E = Electric field

For a coaxial chamber

$$\nabla E^2 = - \frac{2V^2}{r_1^3 \ln[(r_1/r_2)^2]}$$

FIG. 8

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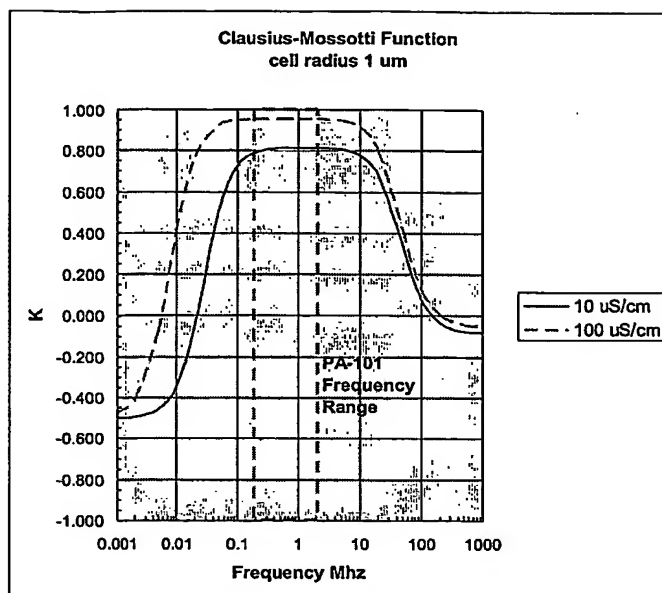


FIG. 9A

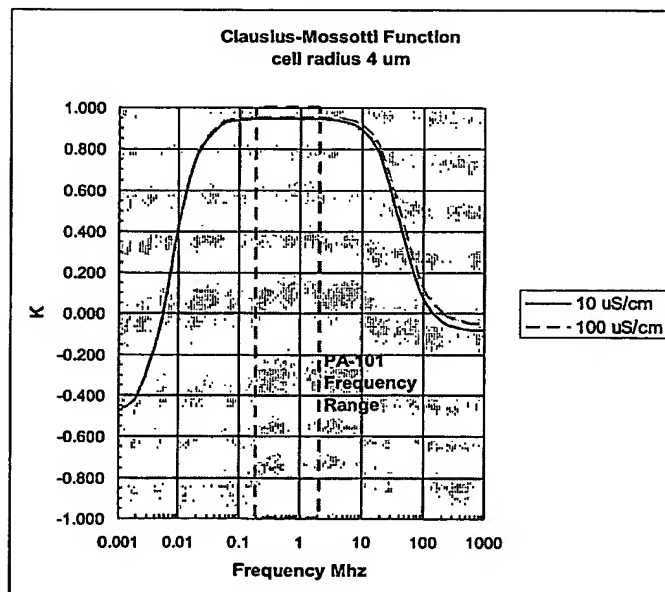
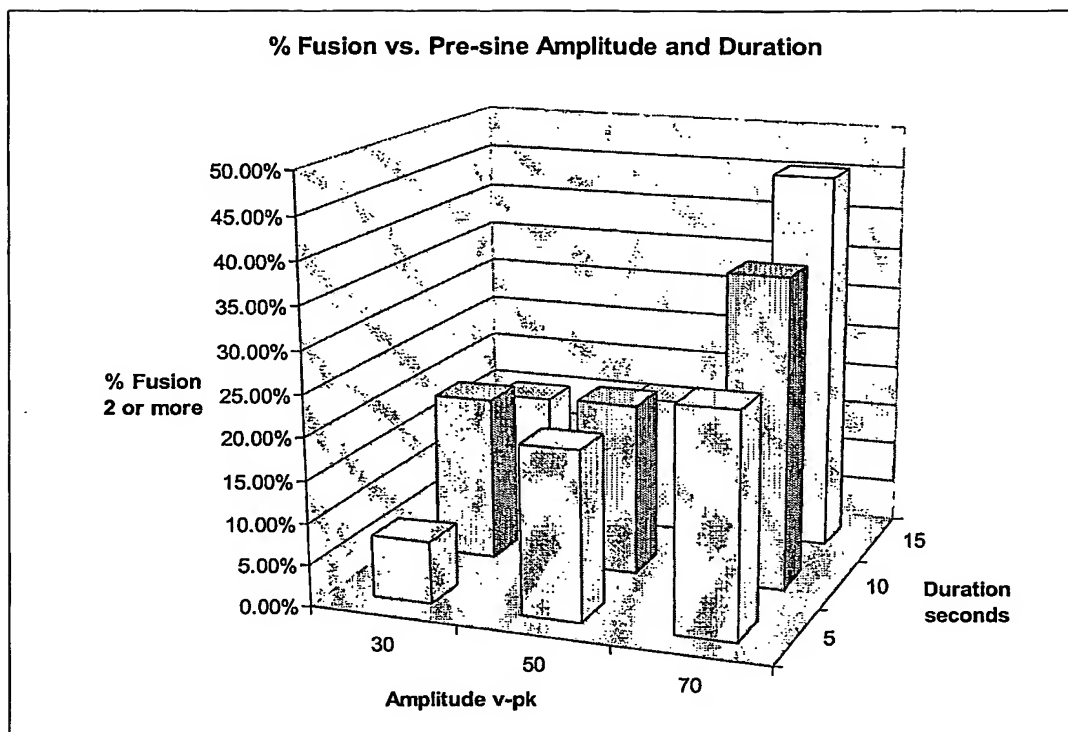


FIG. 9B

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K562 Cells x K562 cells
Cyto Pulse PA-4000/PA-101 Electrofusion system
Cytofusion medium, 80 μ S/cm
6 ml chamber (r1=19.5 mm, r2=23.5 mm, gap = 4 mm)

FIG. 10

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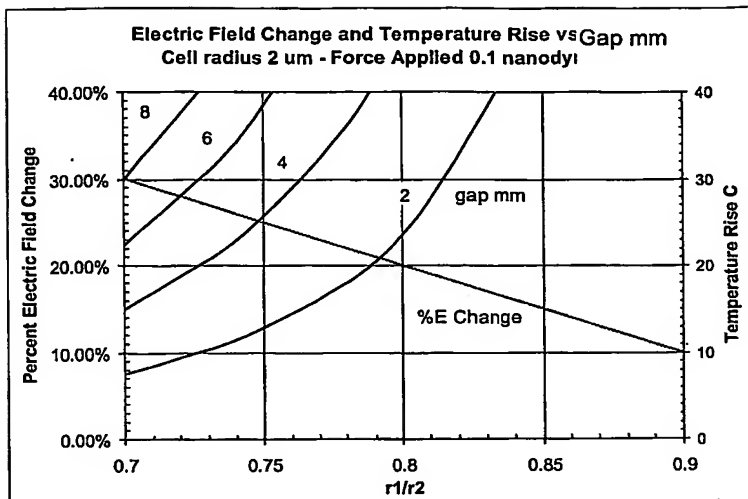


FIG. 11A

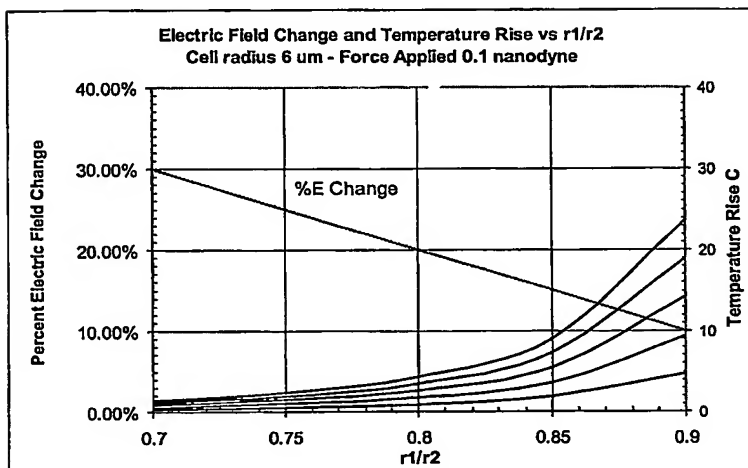


FIG. 11B

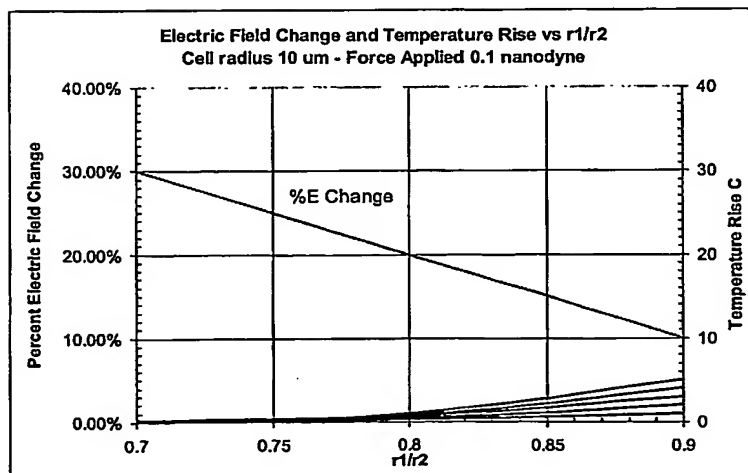


FIG. 11C

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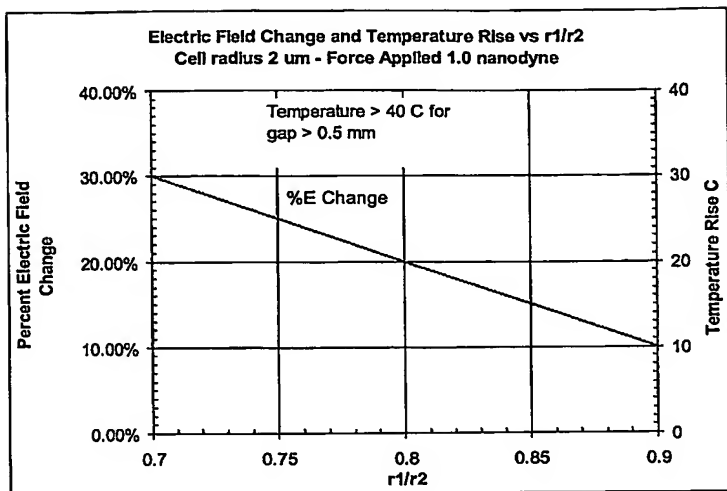


FIG. 12A

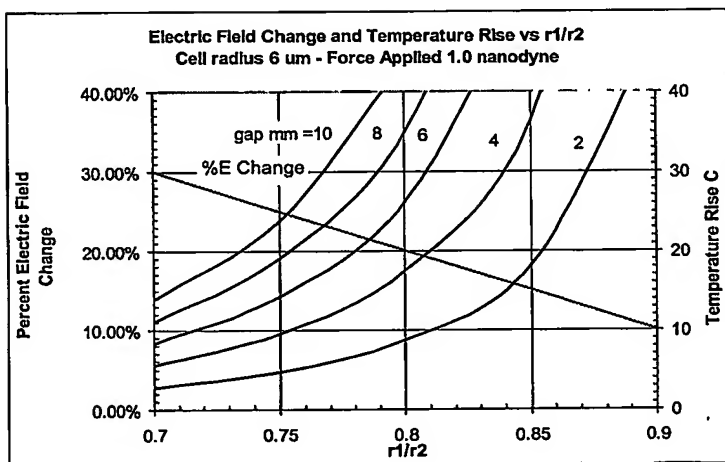


FIG. 12B

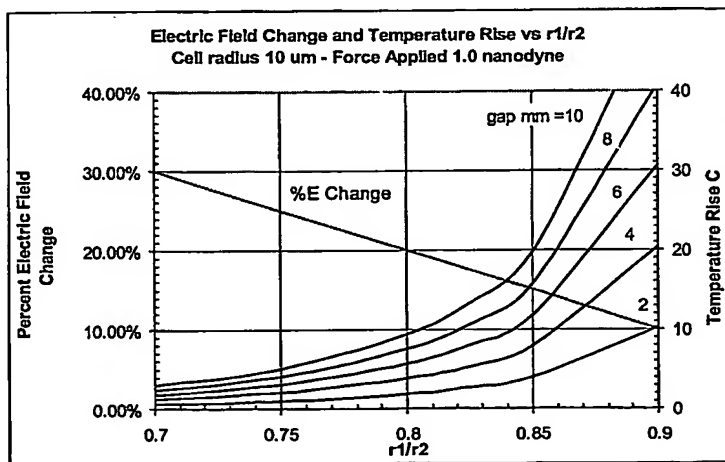


FIG. 12C

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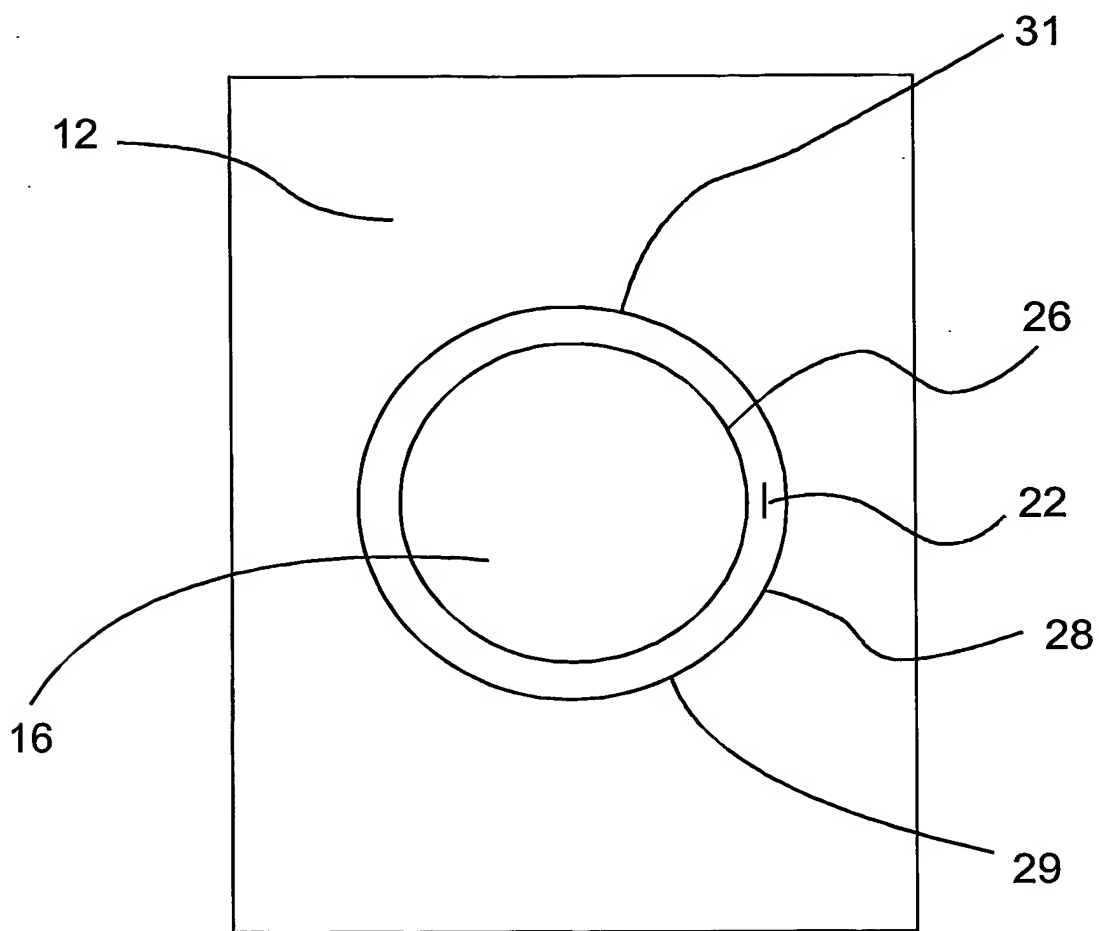


FIG. 13A

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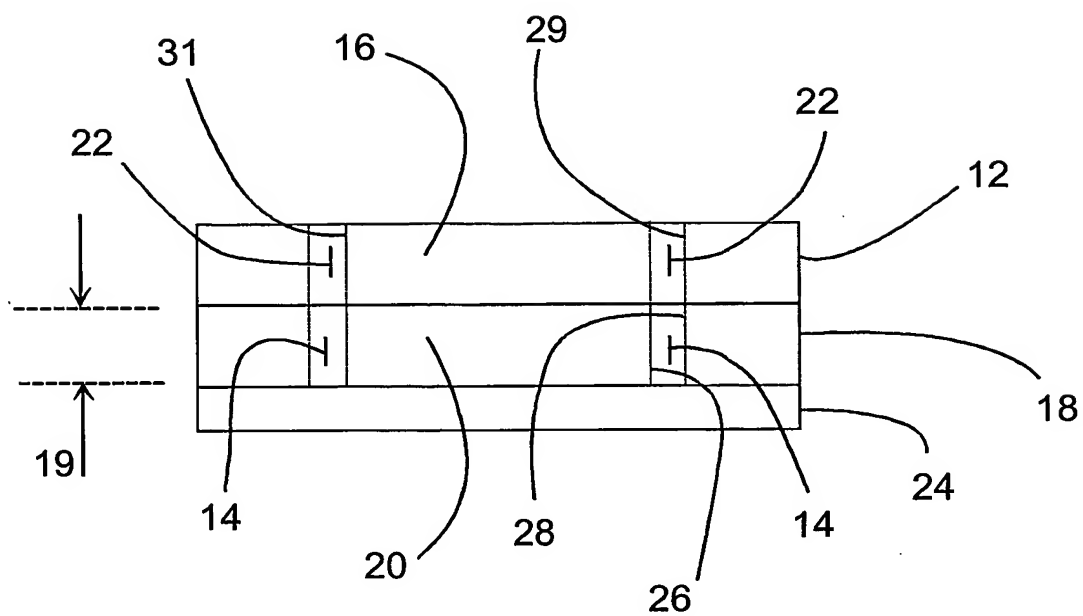


FIG. 13B

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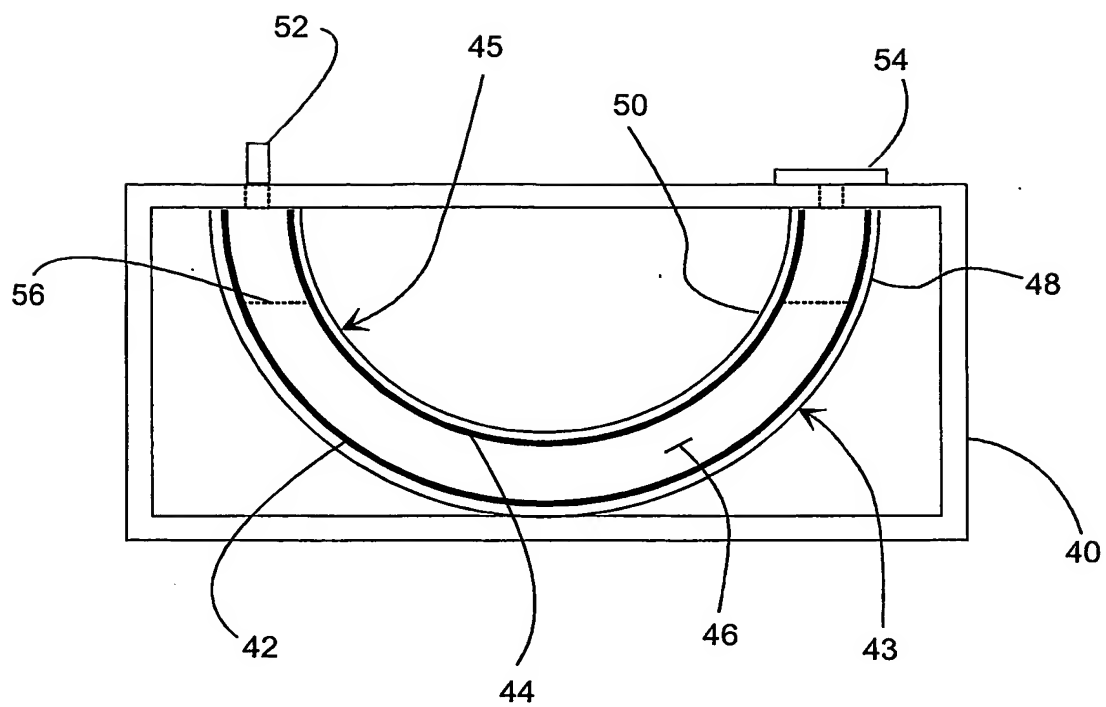


FIG. 14

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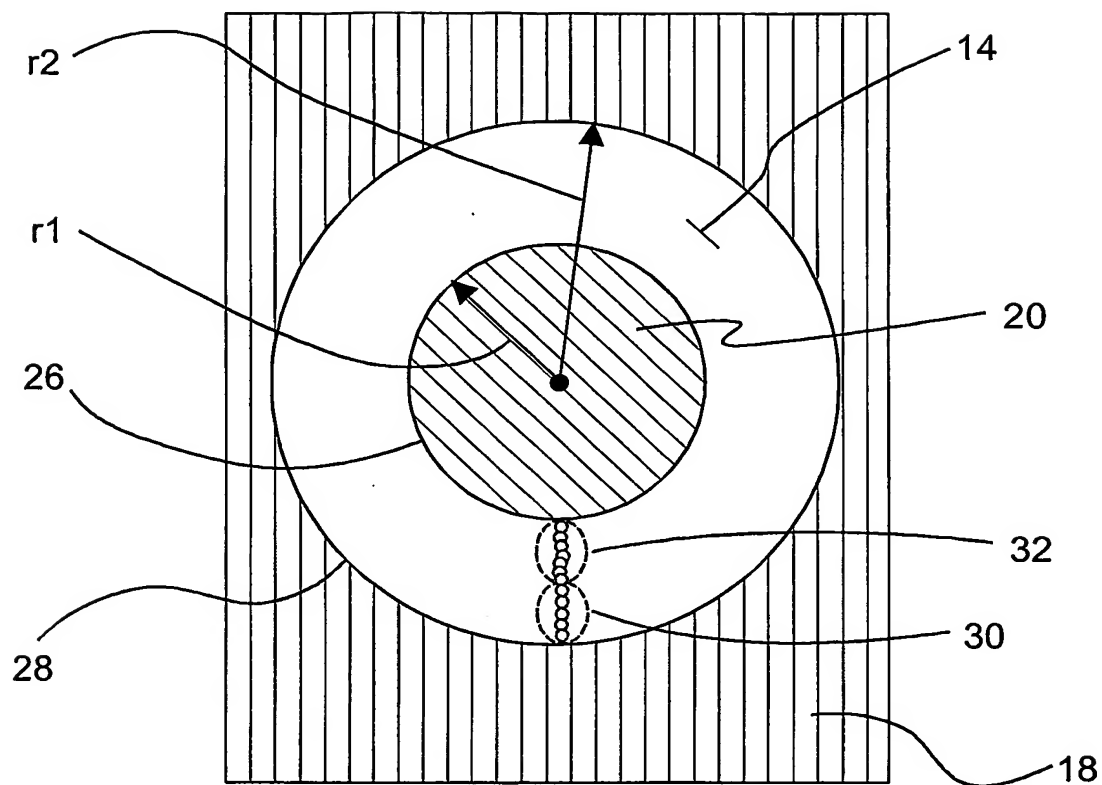


FIG. 15